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Panama mosses

R. S. WILLIAMS

The following rather brief list of mosses is made up of species collected along the Canal Zone by Dr. Marshall A. Howe, in the latter part of 1909 and early in 1910, and by the author, about a year previously, chiefly in the vicinity of Penonomé, some hundred miles west of the zone, and also about Cana, nearly the same distance east of the zone, in the province of Darien.

Of the 39 species listed, 32 occur in South America, 9 species are found in both North and South America, and 6 species, I believe, are known only from Central America.

DICRANELLA HILARIANA (Mont.) Mitt. *Howe*, Culebra, Dec. 1909.

I believe this to be a widely distributed species occurring throughout northern South America, the West Indies, Mexico, and the southern United States. It includes numerous slight varieties that have been given specific names, among others *D. tenuirostris* (Kunze) Mitt., *D. Liebmanniana* (C. M.) Besch., *D. mexicana* (Besch.) Jaeg. and *D. trematodontifolia* (C. M.) Par.

DICRANELLA PERROTETII (Mont.) Mitt. *Williams* 1058, Cana, on earth along ditches, April.

HOLOMITRIUM CRISPULUM Mart. *Williams* 1059, Cana, on trees at 900 m., April.

LEUCOBRYUM GIGANTEUM C. M. *Williams* 1061, Cana, at 1200 to 1800 m.

OCTOBLEPHARUM ALBIDUM (L.) Hedw. *Howe*, Taboga Island, and *Williams* 1048, Penonomé.

FISSIDENS POLYPODIOIDES (Sw.) Hedw. *Williams* 1080, Cana, 1800 m. alt.

SYRRHOPODON BRACHYTELOIDES C. M. *Williams* 1052, Maraganti, at head of Gulf of San Miguel, on trees at 15 m. elevation, April, 1908.

SYRRHOPODON BERNOULLII C. M. *Williams* 1046, near Cana, 1200 to 1800 m. elevation, April, 1908.

HYOPHILA OERSTEDIANA C.M. *Howe*, Taboga Island, on rock, Dec. 1909. This determination is from description by C. Mueller in Syn. Musc. 2: 622. The type specimens were from Nicaragua.

MACROMITRIUM APICULATUM Hook. *Howe*, Gatun and Ahorca Lagarto, Jan. 1910.

MACROMITRIUM MUCRONIFOLIUM Hook. & Grev. *Williams* 1066, on trees near Penonomé at 600 m., March, 1908.

Macromitrium flavopilosum sp. nov.

Pseudoautoicous: in rather loose mats with bare or more or less tomentose creeping stems and rather distant, short, robust, often divided branches up to 2 cm. high, with crowded, spreading-flexuous, slightly undulate leaves; upper leaves 8 to 9 mm. long, narrowly lanceolate, smooth on both sides, serrulate on margin in upper half, gradually tapering into a yellowish, nearly straight, smooth hair point, slightly denticulate at apex and from one third to two thirds as long as blade; leaf cells narrow and elongate throughout with thickened walls, in rather straight rows, without furrows between from base to above the middle, in upper leaf scarcely in rows; perichaetial leaves scarcely differing from stem leaves: seta smooth, about 1 cm. high; capsule scarcely 2 mm. long, smooth, oval; lid convex, with slender, straight beak two thirds the length of capsule; peristome double, papillose, reddish brown, the outer a low cylinder with irregular margin, the inner a little higher than the outer with margin more deeply incised; calyptra without hairs, lacerate below, somewhat rough at apex; spores rough, up to 30μ in diameter.

TYPE LOCALITY: Cana, Prov. Darien, Panama. *Williams* 1063.

A species much like *M. ulophyllum* in habit but leaves less undulate above, without a distinct border and median cells not in oblique rows.

PHILONOTIS SPHAERICARPA (Sw.) Brid. *Howe*, Culebra and Taboga Island, Dec. 1909. This is *P. nanodendra* C. M.

BRYUM CORONATUM Schwaegr. *Howe*, Culebra and Taboga Island; and *Williams*, Penonomé, in cultivated fields.

RHIZOGONIUM SPINIFORME (L.) Bruch. *Williams* 1047, Cana, at 1200 to 1800 m.

PSEUDOCRYPHAEA FLAGELLIFERA (Brid.) E. G. Britton. *Williams* 1076, Cana.

LEUCODONIOPSIS PLICATA Ren. & Card. *Williams* 1068, Cana at 650 m.

PRIONODON DENSUS (Sw.) C.M. *Williams 1062*, Cana.

ORTHOSTICHOPSIS TETRAGONA (Sw.) Broth. *Williams 1069*, Cana at 900 to 1200 m. elevation and *1078*, Marraganti, 15 to 30 m. elevation.

LINDIGIA ACICULATA (Tayl.) Jacq. *Williams 1055*, Cana.

METEORIOPSIS RECURVIFOLIA (Hornsch.) Broth. *Williams 1067*, Cana at about 90 m.

METEORIOPSIS PATULA (Sw.) Broth. *Williams 1079*, Marraganti, 15 to 30 m. elevation.

PHYLLOGONIUM FULGENS (Sw.) Brid. *Williams 1044*, Cana, 1200 to 1800 m. alt. A slender form, var. *gracile* Ren. & Card.

PHYLLOGONIUM VISCOSUM (Palis.) Mitt. *Williams 1045*, Cana at 1500 to 1800 m.

NECKERA UNDULATA (Palis.) Hedw. *Williams 1050*, Marraganti, 30 to 60 m. elevation, April, 1908.

NECKERA DISTICHA Hedw. *Williams 1049*, Marraganti, 30 to 60 m. elevation.

POROTRICHUM COBANENSE C.M. *Williams 1053*, Cana, April, 1908.

PILOTRICHUM AMAZONUM Mitt. *Williams 1105*, Marraganti, April, 1908.

These seem to be the only specimens obtained of this species since the type was collected by Spruce on the Amazon.

Stereophyllum Howei sp. nov.

Autoicous: antheridial buds on stem near the fertile flowers, about 0.5 mm. high, the perigonal leaves ovate, more or less acutely pointed and serrulate with costa often faint, enclosing 4 or 5 antheridia without paraphyses; in thin mats with creeping, somewhat branching stems mostly without radicles, about 1 cm. long; stem leaves mostly 1 mm. long and 0.4 mm. wide, much compressed, inequilateral, elongate-ovate or somewhat lingulate, obtusely or sometimes acutely pointed, smooth on both surfaces, serrulate one half their length or more with flat margins except on narrower side in basal part; costa extending to a little above the middle; leaf cells mostly narrowly linear and somewhat vermicular, the median about 4μ wide and 40 to 80μ long, the alar sometimes scarcely differentiated or of pale, rectangular to nearly square cells, mostly not very numerous; perichaetial leaves

ovate-lanceolate, up to 1 mm. long, serrulate often for three fourths their length, faintly costate in lower half: seta 10 to 12 mm. long; capsule oval, scarcely 1 mm. long, the lid highly conical with short beak rather over one half capsule in length: annulus evidently wanting; outer teeth of peristome with highly projecting lamellae on inner side above the middle, the inner peristome a little shorter than outer, punctate, with lanceolate, keeled, solid segments and stout, solitary cilia; spores smooth, about 16μ in diameter.

TYPE LOCALITY: Taboga Island, Panama Bay.

Collected on a shaded rock by M. A. Howe, Dec. 13, 1909.

This species evidently belongs to the group under G of section 2 of the genus as given by Brotherus in the Engler & Prantl, *Natürliche Pflanzenfamilien*.

CYCLODICTYON LIEBMANNI Schpr. *Williams 1070 and 1075*, Cana, 1200 to 1800 m., April, 1908.

CALLICOSTELLA PALLIDA (C. M.) Jaeg. *Williams 1064*, Cana, 1200 to 1800 m.

LEPIDOPILUM BREVIPES Mitt. *Williams 1057*, Cana, on trees at 900 m., in fine fruit, April 20, 1908. This seems to be the only other collection of this species since the type was collected by Spruce on the Amazon at about the same altitude.

LEPIDOPILUM POLYTRICHOIDES (Hedw.) Brid. *Williams 1056*, Cana at 200 m., in fine fruit, April 20, 1908. Growing in spray of waterfall.

LEPIDOPILUM SEMILAEVE Mitt. *Williams 1054*, Cana, on trees at 1200 to 1500 m. alt.; collected also above Penonomé, *1065*, on branches; in fine fruit, March and April, 1908.

HYOPTERYGIUM TAMARISCI (Sw.) Brid. *Williams 1053*, Cana, at 1800 m.

TAXITHELIUM PLANUM (Brid.) Mitt. *Howe*, Gatun and Mt. Hope, Jan. 1910.

TRICHOSTELIUM FLUVIALE (Mitt.) Jaeg. *Howe*, Mt. Hope.

SEMATOPHYLLUM PUNGENS (Sw.) Mitt. *Williams 1071*, above Penonomé at about 600 m. ele., and *1072*, Cana at 1200 to 1800 m.

RHYNCHOSTEGIUM SCARIOSUM (Tayl.) Jaeg. *Williams 1074*, Cana, on bark at 1200 to 1800 m.

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